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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/901,866	Applicant(s) FOSCHINI ET AL.	
	Examiner Lawrence B Williams	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28,30-41 and 44-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28,30-41 and 44-54 is/are rejected.
- 7) ☒ Claim(s) 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 41 is objected to because of the following informalities: Examiner suggests applicant delete the letter “s” after the word “each” in line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10-11, 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's Admitted Prior Art.

(1) With regard to claim 1, Applicant's Admitted Prior Art discloses a method for use in a system that is adapted to communicate a primitive data stream, the primitive data stream including a plurality of sub-streams, the method comprising the step of: transmitting at least a portion of a processed sub-stream, the processed sub-stream representing one of the plurality of sub-streams, the processed sub-stream including a plurality of strata (layers), each stratum of the processed sub-stream representing a respective sub-stream component of the one sub-stream (pg. 1, lines 23-29). Applicant's claim and prior art teach the layered space-time method.

(2) With regard to claim 10, claim 10 discloses limitations similar to those of claim 1, therefore a similar rejection applies.

(3) With regard to claim 11, Applicant's Admitted Prior art also discloses wherein the system is a multiple output system having at least two transmit antennas; and at a particular point in time each of the processed sub-streams is applied to a respective one of the transmit antennas (pg. 3, lines 23-26).

(4) With regard to claim 20, Applicant's Admitted Prior art discloses a method for processing a received signal that includes at least a portion of at least one processed sub-stream, each processed sub-stream representing a respective one of a plurality of sub-streams, each sub-stream including a respective plurality of sub-stream-components, each processed sub-stream including a plurality of strata, each stratum of each processed sub-stream representing a respective one of the plurality of sub-stream-components of the particular sub-stream represented by that particular processed sub-stream (pg. 3, lines 9-13). Modulation of the encoded sub-stream component before transmission would be inherent, the method comprising the steps of: (a) decoding at least a portion of one of the strata to obtain at least a portion of a respective sub-stream component (pg. 3, lines 18-20), the decoding step further comprising separating out and decoding the portion of the stratum to obtain the sub-stream component portion; (b) removing the decoded portion of the one stratum from the received signal, the removing step further comprising the re-encoding the decoded portion to obtain the one stratum and subtracting the re-encoded stratum from the received signal (pg. 3, lines 20-23); and (c) decoding at least a portion of another of the strata to obtain at least a portion of its respective sub-stream component (pg. 3, lines 27-28).

(5) With regard to claim 21, Applicant's Admitted Prior Art also discloses the method of claim 20, further comprising the steps of: (d) removing the decoded portion of the other stratum from the received signal; and (e) repeating decoding step (c) and removing step (d) until all of the sub-stream-components represented by the strata in the received signal are decoded (pg. 4, lines 16-25).

4. Claim 30 is rejected under 35 U.S.C. 102(e) as being anticipated by Elgamal et al. (US Patent 6,898,248 B1).

Elgamal et al. discloses in Fig. 3, transmitter for use in a system adapted to communicate at least portion of a primitive data stream, the primitive data stream including a plurality of sub-streams, the transmitter comprising: a first stratifier (36a, n'-layering) that stratifies one of the component data streams into a processed sub-stream, the processed sub-stream component having a plurality of strata, each stratum of the processed sub-stream representing a respective one of a plurality sub-stream component of the one sub-stream (col. 8, lines 15-35).

5. Claim 41 is rejected under 35 U.S.C. 102(e) as being anticipated by Elgamal et al. (US Patent 6,898,248 B1).

Elgamal et al. discloses in Fig. 4, a receiver (40) comprising: at least one receive antenna each receive antenna having an output for outputting a receive antenna signal (inherent in the receiver), each receive antenna signal including at least a portion of at least one processed sub-stream, each processed sub-stream representing a respective sub-stream, each processed sub-stream including a plurality of strata, each stratum of each processed sub-stream representing a

respective one of a plurality of sub-stream-components of the respective sub-streams of the processed sub-stream; a processor (44) having an input coupled to the outputs of the receive antennas, the processor operable to decode at least a portion of one of the strata by separating out and decoding the portion to obtain at least a portion of a respective sub-stream component; an encoder/modulator (48a, 50a) a receive signal from the receive antenna signals; decode at least a portion of one of the strata to obtain at least a portion of its respective sub-stream component; remove the decoded portion of the stratum from the receive signal; and decode at least a portion of another of the strata to obtain at least a portion of its respective sub-stream component (col. 9, lines 3-7; col. 8, lines 15-35).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior art as applied to claim 1 above, and further in view of Elgamal et al. (US Patent 6,898,248 B1).

As noted above, Applicant's Admitted Prior Art discloses all limitations of claim 1. He does not however disclose wherein at a particular time the strata that comprise the processed sub-stream are concurrently applied to one transmit antenna.

However, Elgamal et al. discloses wherein at a particular time the strata that comprise the processed sub-stream are concurrently applied to one transmit antenna (col. 22, lines 42-47).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Elgamal et al. with the teachings of Applicant's Admitted Prior Art to provide greater flexibility in terms of the trade-off between power efficiency, bandwidth efficiency and receiver complexity (col. 2, lines 34-39).

With regard to claim 3, Elgamal et al. also discloses wherein the transmitting step comprises transmitting the portion of the processed sub-stream from the start of a signal burst until the end of the signal burst (abstract). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Elgamal et al. with the teachings of Applicant's Admitted Prior Art to provide greater flexibility in terms of the trade-off between power efficiency, bandwidth efficiency and receiver complexity (col. 2, lines 34-39).

8. Claims 4, 5, 6, 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior art as applied to claim 1 above, and further in view of Wallace et al. (US Patent 6,473,467 B1).

(1) With regard to claim 4, as noted above, Applicant's Admitted Prior Art discloses all limitations of claim 1 above. Applicant's Admitted Prior Art does not however, disclose wherein at least one transmit feature of said each stratum of the processed sub-stream is different from transmit features of the other strata of the processed sub-stream.

However, Wallace et al. discloses wherein at least one transmit feature of said each stratum of the processed sub-stream is different from transmit features of the other strata of the

Art Unit: 2634

processed sub-stream. Wallace et al. discloses different coding and modulation schemes (col. 25, lines 9-30).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics (col. 2, lines 20-22).

(2) With regard to claim 5, Wallace et al. also discloses wherein the transmit feature is s bit rate (col. 27, line 62- col. 28, line 13). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(3) With regard to claim 6, Wallace et al. also discloses wherein the transmit feature is power level (col. 27, lines 13-33). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of minimizing interference and to maximize capacity.

(4) With regard to claim 8, Wallace et al. also discloses wherein the stream complies with a CDMA standard (col. 1, line 27). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(5) With regard to claim 9, Wallace et al. also discloses wherein the stream complies with a OFDM standard (col. 2, line 50-53). It would have been obvious to one skilled in the art at the

time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior art as applied to claim 10 above, and further in view of Sampath et al. (US Patent 6,922,445 B1).

(1) With regard to claim 12, as noted above, Applicant's Admitted Prior art discloses all limitations of claim 10 above. Furthermore, Applicant's Admitted Prior art also discloses wherein the system is a multiple output system having at least two transmit antennas (pg. 1, lines 23-26). Applicant's Admitted Prior Art does not however disclose the transmission of processed sub-streams is started concurrently on the at least two transmit antennas. However, Sampath et al. discloses a method and system for mode adaptation wherein the transmission of processed sub-streams is started concurrently on the at least two transmit antennas (col. 7, lines 6-18).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Sampath et al. with the invention of Applicant's Admitted Prior art as a method of determining antenna mappings or selection in a spatial multiplexing mode.

10. Claims 14-16, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior art as applied to claim 1 above, and further in view of Wallace et al. (US Patent 6,473,467 B1).

(1) With regard to claim 14, as noted above, Applicant's Admitted Prior Art discloses all

limitations of claim 1 above. Applicant's Admitted Prior Art does not however, disclose wherein at least one transmit feature of said each stratum of the processed sub-stream is different from transmit features of the other strata of the processed sub-stream.

However, Wallace et al. discloses wherein at least one transmit feature of said each stratum of the processed sub-stream is different from transmit features of the other strata of the processed sub-stream. Wallace et al. discloses different coding and modulation schemes (col. 25, lines 9-30).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics (col. 2, lines 20-22).

(2) With regard to claim 15, Wallace et al. also discloses wherein the transmit feature is a bit rate (col. 27, line 62- col. 28, line 13). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(3) With regard to claim 16, Wallace et al. also discloses wherein the transmit feature is power level (col. 27, lines 13-33). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of minimizing interference and to maximize capacity.

(4) With regard to claim 18, Wallace et al. also discloses wherein the stream complies with a CDMA standard (col. 1, line 27). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the

teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(5) With regard to claim 19, Wallace et al. also discloses wherein the stream complies with a OFDM standard (col. 2, line 50-53). It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

11. Claims 7, 17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Applicant's Admitted Prior Art.

(1) With regard to claim 7, though Applicant's Admitted Prior Art does not explicitly disclose the method of claim 1, further comprising the steps of: dividing each sub-stream into the respective plurality of sub-stream-components; encoding and modulating each sub-stream component to obtain the strata; and combining the strata representing one of the pluralities of sub-stream-components to form one of the processed sub-streams, Applicant's Prior Art does teach the opposite operation, processing the received to decode so-called layers of one of the signals that represent a respective one of the sub-streams (pg. 3, lines 9-13). Modulation of the encoded sub-stream component before transmission would be inherent.

(2) With regard to claim 17, claim 17 discloses limitations similar to those of claim 7, therefore a similar rejection applies.

12. Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art as applied to claim 20 above, and further in view of Wallace et al. (US Patent 6,473,467 B1).

(1) With regard to claim 22, as noted above, Applicant's Admitted Prior Art discloses all limitations of claim 20 above. The Admitted Prior Art does not however teach wherein: the stratum decoded in decoding step (a) is portion of a first processed sub-stream; the stratum decoded in decoding step (c) is portion of the first processed sub-stream after the decoded portion of the one stratum has been removed in step (b); and the signal comprises at least two processed sub-streams; and the method further comprising the steps of: (f) decoding at least a portion of one of the strata that is part of another processed sub-stream; (g) decoding at least a portion of another of the strata that is part of the other processed sub-stream.

However, Wallace et al. teaches wherein: the stratum decoded in decoding step (a) is portion of a first processed sub-stream; the stratum decoded in decoding step (c) is portion of the first processed sub-stream after the decoded portion of the one stratum has been removed in step (b); and the signal comprises at least two processed sub-streams; and the method further comprising the steps of: (f) decoding at least a portion of one of the strata that is part of another processed sub-stream; (g) decoding at least a portion of another of the strata that is part of the other processed sub-stream (col. 24, line 25-col. 25, line 30).

It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics (col. 2, lines 20-22).

(2) With regard to claim 23, Wallace et al. also discloses wherein: decoding step (f) occurs concurrently with decoding step (a); and decoding step (g) occurs concurrently with decoding step (c) (col. 24, line 25 - col. 25, line 30). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(3) With regard to claim 24, Wallace et al also discloses wherein decoding steps (f) and (g) occur after decoding step (c) (col. 24, line 25 - col. 25, line 30). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(4) With regard to claim 25, Wallace et al. also discloses wherein: at least one transmit feature of said each stratum of one of the processed sub-streams is different from transmit features of the other strata of the one processed sub-stream; the transmit features of the stratum decoded in decoding step (a) are the same as the transmit features of the stratum decoded in decoding step (f); and the transmit features of the stratum decoded in decoding step (c) are the same as the transmit features of the stratum decoded in decoding step (g) (col. 25, lines 9-30). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(5) With regard to claim 26, Wallace also discloses wherein at least one transmit feature

Art Unit: 2634

of said each stratum of one of the processed sub-streams is different from transmit features of the other strata of the one processed sub-stream (col. 25, lines 9-30). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(6) With regard to claim 27, Wallace et al. also discloses wherein the transmit feature comprises a bit rate; the stratum decoded in decoding step (a) having a bit rate that is lower than the bit rate of the other strata that are part of the same one of the processed sub-streams; and the stratum decoded in decoding step (c) having a higher bit rate than the bit rate of the stratum decoded in decoding step (a) (col. 27, line 62- col. 28, line 13). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

(7) With regard to claim 28, Wallace et al. also discloses wherein: the transmit feature comprises a power level; the stratum decoded in decoding step (a) having a power level that is higher than the power level of the other strata that are part of the same one of the processed sub-streams; and the stratum decoded in decoding step (c) having a lower power level than the power level of the stratum decoded in decoding step (a) (col. 27, lines 13- 33). It would have been obvious to one skilled in the art at the time of invention to combine the teaching of Wallace et al. with the teachings of Applicant's Admitted Prior Art as a method of providing rapid determination of channel characteristics.

13. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elgamal et al. (US Patent 6,898,248 B1) as applied to claim 30 above in view of Bevan et al. (US Patent 6,891,897 B1) and further in view of Paulraj et al. (US Patent 6,351,499 B1).

As noted above, Elgamal et al. discloses all limitations of claim 30 above. Elgamal et al. does not however disclose wherein the first stratifier comprises; a demultiplexer (20) having an input that receives the one sub-stream and a plurality of outputs each for outputting one of the of sub-stream-components; a plurality of encoder/modulators each having an input coupled to one of the outputs of the demultiplexer, each encoder/modulator encodes and modulates at least a respective one of the sub-stream-components to obtain its respective stratum; and a combiner having a plurality of inputs each coupled to an output of one of the encoder/modulators and an output for outputting the processed sub-stream.

However, Bevan et al. discloses in Fig. 5 (Layered Space-Time (BLAST)) wherein the stratifier comprises; a demultiplexer (DeMux) having an input that receives the one sub-stream and a plurality of outputs each for outputting one of the of sub-stream-components; a plurality of encoder/modulators (Encoder 1-n) each having an input coupled to one of the outputs of the demultiplexer, each encoder/modulator encodes and modulates at least a respective one of the sub-stream-components to obtain its respective stratum (col. 10, lines 49-62).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Bevan et al. with the teachings of Elgamal et al. as a method of increasing spectral and power efficiency (col. 6, lines 1-5).

Neither Elgamal et al. nor Bevan et al. disclose a combiner having a plurality of inputs each coupled to an output of one of the encoder/modulators and an output for outputting the

Art Unit: 2634

processed sub-stream. However, Paulraj et al. discloses in Fig. 3, S-T coding where he discloses combiner (72) having a plurality of inputs each coupled to an output of one of the encoder/modulators (65) and an output (TS1-TSM) for outputting a processed sub-stream.

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Paulraj et al. with the teachings of Elgamal et al. in combination with Bevan et al. as a method of maximizing communication parameters under varying channel conditions (col. 3, lines 15-39).

14. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elgamal et al. (US Patent 6,898,248 B1) in combination with Bevan et al. (US Patent 6,891, 897 B1) in view of Paulraj et al. (US Patent 6,351,499 B1) as applied to claim 31 above and further in view of Jon (US Patent 6,389,000 B1).

(1) With regard to claim 32, as noted above, Elgamal et al. in combination with Bevan et al. in view of Paulraj et al. disclose all limitations of claim 31 above. They do not however explicitly disclose wherein a bit rate of each stratum of the processed sub-stream is different from bit rates of the other strata of the processed sub-stream; the demultiplexer is a variable rate demultiplexer.

However, Jon teaches in a method for transmitting and receiving high speed data, wherein a bit rate of each stratum of the processed sub-stream is different from bit rates of the other strata of the processed sub-stream; the demultiplexer is a variable rate demultiplexer (col. 6, lines 16-26).

Therefore it would have been obvious to one of ordinary skill in the art at the time of

invention to apply the method as taught by Jon to modify the invention of Elgamal et al. in combination with Bevan et al. in combination with Paulraj et al. as a method of offering better resolution in supported data rates (col. 3, lines 59-63).

15. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elgamal et al. (US Patent 6,898,248 B1) in combination with Bevan et al. (US Patent 6,891, 897 B1) in view of Paulraj et al. (US Patent 6,351,499 B1) as applied to claim 31, and further in view of Walton et al. (US 2002/0154705 A1).

Claim 33 inherits all limitations of claim 31 above. As noted above the combination of Elgamal et al., Bevan et al., and Paulraj et al. disclose all limitations of claim 31. They do not however explicitly teach a power level of each stratum of the particular processed sub-stream is different from power levels of the other strata of the particular processed sub-stream; and each of the encoder/modulators is operable to produce the strata such that the power level of each stratum of the particular processed sub-stream is different from the power levels of the other strata of the particular processed sub-stream.

However, Walton et al. teaches teach a power level of each stratum of the particular processed sub-stream is different from power levels of the other strata of the particular processed sub-stream; and each of the encoder/modulators is operable to produce the strata such that the power level of each stratum of the particular processed sub-stream is different from the power levels of the other strata of the particular processed sub-stream ([0137]).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the combination invention of

Art Unit: 2634

Elgamal et al., Bevan et al., and Paulraj et al. as a known method of increasing efficiency and performance in a wireless and voice and data communication system.

16. Claims 34-40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elgamal et al. (US Patent 6,898,248 B1) as applied to claim 30 above, and further in view of Walton et al. (US 2002/0154705 A1).

(1) With regard to claim 34, claim 34 inherits all limitations of claim 30 above. As noted above Elgamal et al. discloses all limitations of claim 30 above. Elgamal et al. does not however teach wherein the transmitter further comprises a primary signal demultiplexer having an input for receiving the primary signal and a plurality of outputs each for outputting one of the sub-streams; a further plurality of stratifiers, each stratifier capable of stratifying at least one of the component data streams into a respective processed sub-stream, each stratum of one of the processed sub-streams representing a respective one of a plurality of sub-stream-components of the respective sub-stream of the one processed sub-stream.

However, Walton et al teaches in Fig. 5A, wherein the transmitter further comprises a primary signal demultiplexer (510) having an input for receiving the primary signal and a plurality of outputs each for outputting one of the sub-streams ($S_1 - S_5$); a further plurality of stratifiers, each stratifier capable of stratifying at least one of the component data streams into a respective processed sub-stream (512a-512e; 532a-532e), each stratum of one of the processed sub-streams representing a respective one of a plurality of sub-stream-components of the respective sub-stream of the one processed sub-stream.

It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication (pg. 1, paragraph [0011-012]).

(2) With regard to claim 35, Walton et al. also teaches wherein at least one transmit feature of said each stratum of the processed sub-stream is different from transmit features of the other strata of the processed sub-stream (pg. 3, paragraph [0134]). It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

(3) With regard to claim 36, Walton et al. also discloses wherein the transmitter is part of a base station of a wireless communication system (pg. 3, paragraph [0036]). It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

(4) With regard to claim 37, Walton et al. also discloses in Fig. 3, wherein the base station has a plurality of antennas. It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

(5) With regard to claim 38, Walton et al. also discloses wherein the transmitter is part of a terminal (pg. 3, paragraph [0036]). It would have been obvious to one of ordinary skill in the

art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

(6) With regard to claim 39, Walton et al. also discloses wherein the wireless communication system is a CDMA system (pg. 1, paragraph [0009]). It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

(7) With regard to claim 40, Walton et al. also discloses wherein the wireless communication system is a OFDM system (pg. 4, paragraph [0048]). It would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Walton et al. to modify the invention of Elgamal et al. as a known method of increasing spectral efficiency and improved performance in a communication.

17. Claims 44-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elgamal et al. as applied to claim 41 above, and further in view of Walton et al. (US 2002/0154705 A1).

(1) With regard to claim 44, as noted above, Elgamal et al. discloses all limitations of claim 41 above. He does not however explicitly disclose wherein the processor is further adapted to remove the decoded portion of the other stratum from the receive signal; and repeat the removing and the decoding of at least a portion of another stratum until all sub-stream-components represented by the strata in the received signal are decoded.

However, Wallace et al. also discloses wherein the processor is further adapted to remove the decoded portion of the other stratum from the receive signal; and repeat the removing and the decoding of at least a portion of another stratum until all sub-stream-components represented by the strata in the received signal are decoded (pg. 11, paragraph [0123-0126]).

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(2) With regard to claim 45, Wallace et al. also discloses wherein the processor is adapted to decode the strata of a first and a second processed sub-stream concurrently (pg. 11, paragraph [0125]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(3) With regard to claim 46, Wallace et al. also discloses wherein at least one transmit feature of each stratum of one processed sub-stream is different from transmit features of the other strata of the same one processed sub-stream; the strata decoded concurrently have the same transmit features (pg. 11, paragraph [0125]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(4) With regard to claim 47, Wallace et al. also discloses wherein processor is adapted to decode the strata of a second processed sub-stream after decoding the strata of a first processed sub-stream (pg. 11-12, paragraph [0123-0125]). It would have been obvious to one skilled in the

art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(5) With regard to claim 48, Wallace et al. also discloses wherein at least one transmit feature of each stratum of one processed sub-stream is different from transmit features of the other strata of the same one processed sub-stream (pg. 12, paragraph [0125]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(6) With regard to claim 49, Wallace et al. also discloses wherein the transmit feature comprises a bit rate [pg. 13, paragraph (0142)]. It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(7) With regard to claim 50, Wallace et al. also discloses wherein the transmit feature comprises a power level (pg. 13, paragraph [0137]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(8) With regard to claim 51, Wallace et al. also discloses wherein the receiver is part of a base station of a wireless communication system (pg. 3, paragraph [0036]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(9) With regard to claim 52, Wallace et al. also discloses wherein the receiver is part of

Art Unit: 2634

a terminal (pg. 3, paragraph [0036]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(10) With regard to claim 53, Wallace et al. also discloses wherein the wireless communication system is a CDMA system (pg. 3, paragraph [0036]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

(11) With regard to claim 54 Wallace et al. also discloses wherein the wireless communication system is a OFDM system (pg. 4, paragraph [0048]). It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Walton et al. with the teachings of Elgamal et al. as a method of providing increased efficiency of the receiver.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Hassibi et al. discloses in US Patent 6,693,976 B1 Method of Wireless Communication Using Structured Unitary Space-Time Signal Constellation.

b.) Horng et al. discloses in US 2004/0032910 A1 MIMO systems With STTD Encoding and Dynamic Power Allocation.

c.) You discloses in US 2003/0021355 A1 Method and System for Transmitting and Receiving Signal In Mobile Communication.

d.) Boariu et al. discloses in US Patent 6,965,237 B1 Method and System For Digital Signal Transmission.

e.) Calderbank et al. discloses in US Patent 6,127,971 Combiner array Processing and Space-Time Coding.

f.) Tellado et al. discloses in US Patent 6,711,412 B1 Interference Mitigation in Wireless Communications by Training of Interference Signals.

f.) Lo et al. discloses in US Patent 6,470,043 B1 Near -Optimal Low-Complexity Decoding of space-Time Codes for Fixed Wireless Applications.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 09/901,866


Page 24

Art Unit: 2634

Lawrence B. Williams

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